Gastric Ulcer and Cancer

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In offering this paper to the state society I have in mind chiefly to present the past year's (1905) experience that bears upon the etiological relationship that exists between ulcer and cancer of the stomach.

In the later nineties our attention was strongly attracted by the many long histories of "dyspeptic" trouble that preceded cancer of the stomach, and the thought that ulcer was this precancerous condition became firmly implanted. Since that time this class of cases has been followed out with more or less care and from time to time placed before you for consideration. Each succeeding year has strengthened our belief and with the more careful pathological examination of the excised parts we stand to-day on firmer footing.

The clinical histories have not held to so high a point as they did the first three years, but the average for the whole term is still about 60%. While the clinical evidence falls somewhat the pathological is quite remarkable.

In 1903 we demonstrated pathologically that 15% of gastric cancers had ulcer base and in 1904 this per cent easily reached 18. This added to our clinical record was satisfactory to our hypothesis. The year 1905 has presented its clinical proof in a fairly definite manner, a little less than one half (47–49%) of the cases have histories ranging from three to thirty-seven

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years' duration. If to these we add those of two years' standing the per cent reaches 61.

Convincing and satisfactory as a long pre-cancer history may be, it is not necessary that it shall be manifest in order to declare that ulcer was the precursor; first, because cases with short histories and absolute pathological proof are multiplying daily; second, attacks may be weeks, months, years separated and the earlier disturbance quite forgotten in the present severer form. These long periods of latency are quite frequently noted when carefully developing the history of a present annoying condition; third, many cases of hemorrhage, perforation and obstruction have had no previous history whatever, or if any but brief and slight, and yet the lesion proved to be ulcer of long standing. Cancerous change may take place in these latent forms and the first symptoms may be manifested only when obstruction, hemorrhage, perforation or poisoning has advanced to a decided degree. Fourth, cancers with a history of one to six weeks, yet so advanced that an operation cannot be undertaken, can scarcely be considered as lacking a period of latency of some nature.

In view of the fact that ulcer may, and often does, have a latent period of years; and that cancers with short (manifest) histories frequently do show old ulcer base, it seems just to assume that many, if not all, rapidly developing gastric cancers have found a fertile soil on a previously developed ulcer area.

Though perhaps not yet absolutely demonstrable it seems to me that hyperchlorhydria (or hypersecretion) precedes ulcer and is a constant causative factor and that ulcer is the precursor of cancer; at any rate the histories are often typical of this and the findings abundant in proof.

In eliciting the history of gastric cancer there are three types found: (1) Those in which the initial symptoms were slight and a long latent period has intervened; (2) those in which the acute symptoms seem suddenly to attack the patient in the very midst of health and (3) those with a long series of repeated attacks which are evidently precancerous. In the first and third the precancerous history is that of ulcer; what the precursor is in the second is being determined through surgery and skillful pathological technique.

Basing conclusions on the many histories taken at our clinic, I would distinguish about *four* stages in gastric ulcer development and would expect cancer when it did develop to appear in the third or fourth stage or often to be the fourth stage.

(1) In the first stage of ulcer there is unusually good appetite with nutrition at par or even excessive; pain two to five hours after meals, when the stomach is empty or emptying itself; the heartier the meal the longer and more complete the sense of stomach satisfaction, (over-active digestion) perhaps some gas and sour eructations; occasional vomiting of small amounts of sour bitter liquid; stomach normal as to position and size; excess of hydrochloric acid, otherwise normal. These patients present themselves to be relieved of pain which they say comes after meals, but which, in reality, is premeal pain.

(2) The second stage may be established some months later, following several intermissions with recurrences, each increasing more or less in severity; appetite good, though perhaps not above normal; less satisfaction follows the hearty meal; pain is severe and comes sooner after food; distress or discomfort may be present even when so-called pain is absent, gas is usually complained

of; sour eructations common; vomiting of sour, bitter acrid fluid at times mixed with food is frequent; a sense of relief follows vomiting for a greater or less period; loss of flesh often noted during the attack either through voluntary or prescribed dieting; rapid gain takes place during intermission. Perhaps some dilatation; acidity high or normal.

(3) In the third stage desire for food may remain, it may be fair or decreasing, but the patient is afraid to eat because of distress, pain, gas, vomiting, sour eructations, bloating or sour burning stomach; there is but short food relief if any; perhaps obstructive symptoms; loss of flesh usual, and even cachexia may be present. Constipation, marked in all stages, is usually obstinate here. Stomach dilated and prolapsed, hydrochloric acid normal, lessened or even absent; blood may be found during any stage at test meal, but more frequently here than previously because, other conditions being equal, the chemical and mechanical powers of the stomach are such that blood destruction (digestion) is retarded.

It is often extremely difficult to mark the distinctive period of transition of the third stage, which is ulcer, into a fourth which is cancer, so imperceptibly may it take place. Some patients are weak, emaciated and even cachetic, with ulcer the only lesion (1) if the motor power of the stomach be greatly interfered with, or (2) if the lesion be large and destruction great even in the presence of mild obstruction. Here the transition may begin and though all possible diagnostic means and precautions are taken, yet sometimes a differentation cannot be made until widespread degeneration removes all hope of cure. But when the clinician is awakened to his import-

ant task he will at least reach the point of honest suspicion and call *legitimate* surgery to his aid.

Many times one does find symptoms that offer a basis for differentiation. Pyrosis increases in amount, but is, perhaps, less acute in character. Often on stooping or during the night fluid which has some acidity pours from the stomach and awakens the patient; gas, bloating and a distended discomfort increases. Pain, nausea and vomiting are more constant and more often excited by liquid food, but the pain is usually less intense; appetite may persist to quite the end, but, as a rule, it gradually lessens until finally the patient may turn from food with nausea. Nervousness and languor are combined; weakness and faintness creep on; the patient's ability to exert himself decreases rapidly; anemia may come speedily; the flesh wastes decidedly; a languid air, a paleness about the eyes, nose and mouth, associated with a pinched expression (a toxemic look) are common. All this points directly to a transition.

The character of the pain changes; it is dull, sickening, more continuous but not so regular in recurrence and more wearing. The severer attacks come at unexpected times; as a rule sooner after food and are not so acute. There is more relief from eructations of gas and vomiting. The pain is more diffuse and not so often eased by pressure or position. Localization of pain, though not always very definite in ulcer, is much less so in cancer. As in ulcer, if perforation has taken place there may be a wide field of radiation, otherwise the epigastrium is the seat of pain. As cancer progresses diffuseness of pain increases. The diagnosis must, however, occasionally be made in the absence of pain.

Vomiting, always a prominent symptom,

usually intensifies as malignancy creeps on. It is more irregular, longer between attacks, more copious (unless there be a contracted stomach from diffuse infiltration), and gives even more relief; the vomitus is rancid, often foul, acid and obnoxious; all these symptoms vary in intensity according to obstruction and destruction; but the chief characteristic of cancer vomiting is that food taken several hours or even days before returns poorly macerated and with undigested masses in it and even this perhaps when pyloric obstruction is slight (cancer paralysis). Vomiting is, as a rule, accompanied with less retching in cancer than in ulcer and blood more frequently seen though in small quantities; mucus is, perhaps, oftener seen, while bile is a rarer accompaniment. If there has been a long period between the ulcer symptoms and the recent cancerous change (Type 1) the diagnosis is usually easier because of the constancy, the rapid approach, and marked character of the symptoms. There may be a short but persistent period of flatulence, bloating, lessened appetite and loss of flesh and then the sudden burst of malignancy so often remarked in the other type (Type 2) that clinicians say attacks the patient in the very height of good health. In these two types we most often meet tumor, and in many other respects are they so similar that we would be led to consider them counterparts — the early symptoms in the one being overlooked or forgotten by the otherwise healthy individual.

Motor power lessens rapidly as cancer progresses and if pyloric obstruction is acute and the other symptoms are intense *dilatation* advances rapidly; organic acids increase and hydrochloric acid decreases and blood is more often and more easily detected. Finally, it is

the (general) composite pathological picture that the patient presents at the clinic quite as often as the symptoms he urges upon you that fixes the period when the benign has yielded to the malignant (condition).

Fourth, when we reach the undoubted fourth stage (cancerous) the whole picture intensifies, "and he who runs may read." The appetite is poor or absent, or even the smell of food may be repulsive. Meats and fats are especially avoided. Emaciation follows rapidly, often more so than can be accounted for by loss of appetite (toxic or perhaps food delay); strength drops from under the patient, languor is intense and he exerts himself with difficulty; the anemic-cachectic condition develops more and more clearly. The body becomes emaciated, the skin dry, wrinkled and lemon yellow. Pain increases and is constant, boring and undermining, less acute and more sickening; food, if tolerated, almost immediately increases it; frequent vomiting of quantities of poorly macerated and undigested food, rancid and offensive, coffee-ground color; blood more copious, oftener and more easily detected because of the further decreased or absent motor power; sour stomach, sour eructations and gas become distressing; obstinate constipation, mental depression, extreme languor, cachexia, prolapse, dilatation, tumor, lactic acid fermentation, absence of hydrochloric. When these are present, the condition scarcely remains in doubt.

The picture of cancer where no obtainable precancerous symptoms are elicited, or where a long period has elapsed since symptoms are recalled, is practically that of the late stages of those with long preceding history. One must be ready to diagnose cancer of the stomach with one

or few symptoms, the general condition and pathological picture of the patient bearing out the meager findings.

In our series of cases the males and females ran in proportion of 4 to 1 and ranged in age from twenty-nine to seventy-six years, the average being a little over fifty. About three fourths of the whole number presented themselves for amelioration of symptoms that had been pressing, for one year or less — that is, previous symptoms had not been so alarming that medical aid had been anxiously sought, or, to put it fairly, malignant manifestations had been present for only one year or less, the average being a little less than five months. Twenty-three (23) of the number that presented long histories complained of malignant symptoms only a year or less, the average in this number being a trifle more than five months. This seems to have a significant bearing — the same soil in each instance.

In this series of 1905 pain was rather constant. In 8 the histories did not state either way, one said no pain, the remainder (73) openly declared for pain, most of them complaining rather bitterly.

Vomiting was not recorded in 11 histories, 3 stated no vomiting, while the great number (68) complained more or less severely. In 42 the lesion was situated at the pylorus or lesser curvature, 3 at the cardia. The location was not recorded in many of the inoperable cases, but the symptoms, for which the operation was undertaken, most often spoke for pyloric end or lesser curvature location.

Of the whole number operated upon 67 had test meals and other routine stomach examinations, chemical and physical. Tumor was present 27 times and doubtful in 3 more. Dilatation

present 54 and obstruction 36 times. In 32, free hydrochloric acid was present ranging from 1–50 acidity; combined in 32; lactic, 42; fatty, 19; both hydrochloric and lactic, found 13 times. Blood was found often. During the last eight or nine months there were but 10 patients in which it was not found at test meal. The preceding three or four months it was not so often found, doubtless because of less careful technique.

There were 39 cases in which a portion of the stomach was removed and submitted to the pathologist, Dr. Louis B. Wilson, for macroscopical and microscopical examination, a full report of which he has in preparation. I here give in brief the results: in over half (54%) (21 in number) the pathological evidence was good that cancer had developed on an old ulcer base, in one fourth (25.60%) (10 cases) the evidence was fair that the same was true, while 8 gave no evidence of preceding ulcer irritation. Then in over three fourths (79.5%) the pathological evidence was good or fair that ulcer was first as a cause. Twenty-one (21) of the thirty-nine (39) had long histories, fourteen (14) of which gave good pathological evidence, six in which the histories were long, gave evidence considered only fair, 7 cases whose histories ranged from two months to two years gave good pathological evidence, and 4, the histories of which covered from one and one-half months to two years, offered fair proof. Histories and pathological findings ran together both positive in over half (54%) the cases.

The above figures seem to emphasize two points: (1) That short histories and ulcer as the old lesion on which cancer is engrafted are not incompatible, as some argue. (2) That ulcer is the great and fertile soil of cancer.